Claims 3-6, 10 and 11 stand rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claims 3-6, 10 and 11 and also non-elected claims 7 and 12 have been amended to recite a first extruded tube, a first expanded tube, a second extruded tube, and a second expanded tube. These claims no longer recite "inner" and "outer" tubes. The claims have also been amended to recited "an end" and "a pair of ends," also removing the "inner" and "outer" language.

Claim 10 has been amended to clarify that the melted nonborene polymer is hot extruded. Claim 10 has also been amended to clarify that the first tube has a plurality of first tube grooves, the first mold has a plurality of first mold grooves, the second tube has a plurality of second tube grooves, and the second mold has a plurality of second mold grooves. The step "attaching said at least one cell to said flange" has been deleted from the line 14 of claim 10. Claim 11 has been amended clarify that the flange is made of a different norbonrene polymer.

The Examiner also rejected claim 10 stating that there is insufficient antecedent basis for the limitation "said flue gas passage" in lines 15-16. The antecedent basis for the limitation is found in lime 12 of claim 10.

Claims 1 and 2 stand rejected under 35 U.S. §103(a) as being unpatentable over Fletcher et al (U.S. Patent No. 5,078,946) in view of Ueno et al (United States Patent No. 5,098,750). Claim 2 also stands rejected under 35 U.S. §103(a) as being unpatentable further in view of Ninomiya et al (United States Patent No. 5,525,288). Fletcher discloses a method for manufacturing a heat exchanger including a plurality of tubes which are made of a thermoplastic polymer. In column 8, lines 17 to 24, it is disclosed that it is preferred that the tubular portions of the heat exchanger are formed from a composition of a polyamide. The tubular portions are disclosed as being injection molded. Ueno discloses composite molded articles having a base polymer of polynorbornene polymer. Ninomiya discloses a method of manufacturing a hose including extruding the hose and then expanding the hose in a mold to conform the hose to a cavity surface of the mold. The Examiner contends that it would obvious to one having ordinary skill in the art to form the heat exchanger of Fletcher of polynorbornene polymer, and therefore claims 1-2 are obvious. The Examiner also contends that it would be obvious to extrude the tubular portions of Fletcher, rather than injection molding the tubular portions.

It would not be obvious to form the heat exchanger of Fletcher of the polynorbornene polymer of Ueno. As disclosed in Applicant's specification, employing norbornene polymer provides several advantages over the prior art. Norbornene polymer has good temperature resistance to the high temperatures of the flue vent gases. Norbornene polymer also has physical and chemical resistance to the acidic condensate that is formed by the condensing heat exchanger, which reduces corrosion. Norbornene polymer is also inexpensive and can be used in the current commercial extrusion and blow molding processes. Forming a plurality of cells of a heat exchanger of a norbornene polymer provides many advantages over the prior art. Applicant is not claiming to have invented a heat exchanger formed of a polymer, but is rather claiming a unique heat exchanger formed of a unique material that provides many advantages. Fletcher does not teach a norbornene heat exchanger, but rather teaches the use of a different polymer, polyamide, as the preferred material. Even when combined with the extrusion process of Ninomiya, there is no suggestion in any of the references to make a heat transfer component of a plurality of cells of a norbornene polymer as required by Claims 1 and 2. Claims 1 and 2 are not obvious.

Claims 1-4 stand rejected under §103(a) as being unpatentable over Ripka et al (United States Patent No. 5,098,750) in view of Fletcher et al and in view of Ueno et al. Claims 2-3 stand rejected under §103(a) as being unpatentable over Ripka et al in view of Fletcher et al in view of Ueno et al. as and further in view of Ninomiya et al and Taga (United States Patent No. 3,425,092).

Ripka discloses an air heating apparatus 11 including heat pipes 201. An evaporating part 204 of the heat pipes 201 is located inside a combustion chamber 13 and a condensing part 205 of the heat pipes 201 is located inside an air heating chamber 14. The tubes can be straight 201b or U-shaped 201a. The radiant burner 15 blocks the path of the pipes 201. Therefore, the heat pipes 201a proximate to the radiant burner 15 are u-shaped to accommodate the radiant burner 15, which extends through the u-shaped portion of the pipes 201a. Ripka discloses that the heat pipes 201 are made of copper. The Examiner contends that it would be obvious to provide the air heating apparatus 11 of Fletcher with the polymer tubes as disclosed in Fletcher that are made of a norbornene as disclosed in Ueno. Taga discloses extruding a thermoplastic material that is shaped into a tube by employing compr ssed air. The Examiner contends that it would also be

obvious to provide the air heating apparatus 11 of Ripka with the polymer tubes of Fletcher which are made of norbornene as disclosed in Ueno, and further to form the tubes by hot extrusion as disclosed in Ninomiya and Taga.

Ripka discloses in column 6, lines 39 to 40, that the tubes 201 of the air heating apparatus 11 are made of copper. There is no suggestion in Ripka to make the tubes 201 of a polymer, such as norbornene, as required by Applicant's claims. Ripka teaches the use of a non-polymer material. There would therefore be no suggestion to make the tubes of Ripka of the polymer norbornene as suggested Fletcher and Ueno, and claims 1-4 are not obvious.

Claims 5, 6, 10 and 11 stand rejected under §103(a) as being unpatentable over Ripka et al in view of Fletcher et al in view of Ueno et al. as and further in view of Larinoff (United States Patent No. 5,787,970). Larinoff discloses an air-cooled vacuum steam condenser having a tube 10.2 located between tubes 10.1 and 10.3. The tubes 10.1 and 10.3 are connected by a rear header 22.3 to form a u-shaped tube. The Examiner contends that it would be obvious to provide a straight tube positioned between an opening of U-shaped tubes as disclosed in Larinoff, and therefore claims 5, 6, 10 and 11 are obvious.

It would not be possible to employ the arrangement of Larinoff in Ripka. Larinoff discloses a tube that is positioned within an opening of a u-shaped tube. In Ripka, the radiant burner 15 blocks the passage of the tubes 201. Therefore, u-shaped tubes 201a are employed around the radiant burner 15 because the radiant burner 15 would block the path of the tubes 201 if they were straight. As the radiant burner 15 is positioned within the opening of the u-shaped tubes 201a, it would not be possible to position a straight tube 201b within the opening of the u-shaped tubes 201a. Therefore, it would not be possible to combine Larinoff with Ripka. Additionally, as stated above, Ripka discloses that the tubes 201 are make of copper and there is no suggestion to make the tubes 201 of Ripka of a polymer such as norbornene as required by Applicant's claims. Claims 5-6, 10 and 11 are not obvious.

Thus, claims 1-10 and 12-27 are in condition for allowance. No additional fees are seen to be required. If any additional fees are due, however, the Commissioner is authorized to charge Deposit Account No. 50-1482, in the name of Carlson, Gaskey & Olds, P.C., for any additional fees or credit the account for any overpayment. Therefore, favorable reconsideration and allowance of this application is respectfully requested.

60246-141

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CERTIFICATE OF FACSIMILE

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office, TC 1700, Before Final, 703-872-9310 on February 7, 2003.

Karin Butchko

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

CLAIMS

2. (AMENDED) The method as recited in claim 1 wherein the step of forming each of said plurality of cells includes melting said norbornene polymer and hot extruding said norbornene polymer to form at least one extruded tube.

3. (AMENDED) The method as recited in claim 2 wherein the step of forming each of said plurality of cells includes extruding [an inner] a first extruded tube and [an outer] a second extruded tube, the method further comprising expanding said inner extruded tube with air in [an inner] a first mold to form [an inner] a first expanded tube and expanding said [outer] second extruded tube with air in [an outer] a second mold to form a substantially u-shaped [outer] second expanded tube.

4. (AMENDED) The method as recited in claim 3 wherein said [inner] first expanded tube and said [outer] u-shaped second expanded tube include a plurality of [tubes] tube grooves formed by expanding said [inner] first extruded tube and said [outer] u-shaped second extruded [tubes into] tube in said [inner] first mold and said [outer] second mold, respectively, each including a plurality of mold grooves on an inner surface of said first mold and said second mold.

5. (AMENDED) The method as recited in claim 3 wherein said first expanded tube includes an end and said second expanded tube includes a pair of ends, and the method further comprises [comprising] the step of attaching [an inner] said end of said [inner] first expanded tube and [a] said pair of [outer] ends of said [outer] u-shaped second expanded tube to a flange to form one of said cells, and said [inner] first expanded tube is located [being positioned] in an opening of said [outer] u-shaped second expanded tube [positioned] that is defined between said pair of [outer] ends, and a flue gas passage containing a flue gas is [being] defined between said [inner] first expanded tube and said [outer] u-shaped second expanded tube.

6. (AMENDED) The method as recited in claim 5 wherein said flange is made of [said] a norbornene polymer, and the step of attaching said [inner] end and said [outer ends] outer ends to said flange includes thermally adhering said [inner] first end and said [outer] pair of ends to said flange.

7. (AMENDED) The method as recited in claim 5 wherein said flange is made of metal, and the step of attaching said [inner] first end and said [outer] pair of ends to said flange includes heating and flaring said [inner] first end and said [outer] pair of ends.

8. (AMENDED) The method as recited in claim 2 wherein the step of forming each of said plurality of cells includes [include] expanding said at least one extruded tube with air in a mold to form a substantially w-shaped expanded tube and attaching a pair of ends of said expanded tube to a flange to form one of said cells, a flue gas passage being defined in said expanded tube.

10. (AMENDED) A method for making a heat transfer component comprising the step of:

melting a norbornene polymer;

hot extruding [an inner] said melted norbornene polymer to form a first extruded tube and [an outer] a second extruded tube;

expanding said [inner] first extruded tube with air within [an inner] a first mold having a plurality of first mold grooves on an inner surface of said first mold to form [an inner] a first expanded tube having a plurality of first tube grooves and expanding said [outer] second extruded tube with air within [an outer] a second mold having [said] a plurality of second mold grooves on an inner surface of said second mold to form a substantially u-shaped [outer] second expanded tube having [said] a plurality of second tube grooves; and

attaching an [inner] end of said [inner] first expanded tube and a pair of [outer] ends of said [outer] second expanded tube to a flange to form [one of] at least one cell, and said [inner] first expanded tube is located [being positioned] in an opening of said [outer] second expanded tube [positioned] defined between said pair of [outer] ends, and a flue gas passage containing a flue gas is [being] defined between said [inner] first expanded [outer] tube and said second expanded tube[; and].

[attaching said at least one cell to said flange, an air flow passage is defined between each of said at least one cell to exchange heat with flue gas flowing through said flue gas passage].

11. (AMENDED) The method as recited in claim 10 wherein said flange is made of [said] a norbornene polymer, and the step of attaching said [inner] end and said [outer] pair of ends to said flange includes thermally adhering said [inner] end and said [outer] pair of ends to said flange.

12. (AMENDED) The method as recited in claim 10 wherein said flange is made of metal, and the step of attaching said [inner] end and said [outer] pair of ends to said flange includes heating and flaring said [inner] end and said [outer] pair of ends.

21. (NEW) The method as recited in claim 3 wherein said first mold has a bottom portion and a top portion, further including the steps of positioning said first extruded tube in said bottom portion of said first mold and placing said top portion on said bottom portion to retain said first extruded tube therebetween.

22. (NEW) The method as recited in claim 5 wherein said u-shaped second expanded tube is continuous between said pair of ends.

23. (NEW) The method as recited in claim 10 further including a second at least one cell, and an air flow passage is defined between said at least one cell and said second at least one cell.

24. (NEW) A method for making a heat transfer component comprising the steps of:

forming a plurality of cells of a norbornene polymer, each of said cells including a first expanded tube and a second u-shaped expanded tube having a pair of ends and an opening defined between said pair of ends, said second u-shaped expanded tube is continuous between said pair of ends, and said first tube is located in said opening; and

using said cells as part of said heat transfer component.

25. (NEW) The method as recited in claim 24 wherein a flue gas passage is defined between said first expanded tube and said u-shaped second expanded tube.

26. (NEW) The method as recited in claim 24 further comprising the step of attaching an end of said first expanded tube and said pair of ends of said u-shaped second expanded tube to a flange to form one of said cells.

27. (NEW) The method as recited in claim 24 wherein said flange is made of a norbornene polymer, and the step of attaching said end and said outer ends to said flange includes thermally adhering said first end and said pair of ends to said flange.